LGL-3-14-1622

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

~~WASHINGTON, D.C.~~

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U. S. DEPARTMENT
OF AGRICULTURE

March 26, 1938

MEMORANDUM FOR R. L. FURNISS

(Through Dr. F. C. Craighead)

In reply to your memorandum of February 10, 1938, received by me March 15, I would suggest a postponement of the parasite study of the satin moth until next year at least.

My reasons for this are in consideration of the amount of work involved and the experience necessary for the observer. I am sure that you will appreciate the latter after reading this letter.

The plan of work followed by me in 1935 was as follows:

"In following up satin-moth observation work conducted by A. B. Proper it seemed to both J. E. R. Holbrook and myself that the system of using a band around the trees from 3-5 ft. was not exactly satisfactory. In some points it would be impossible to examine 5 such bands within the allotted time if the infestation was at all plentiful.

"I believe that random sample of the trees based on a definite period of time would be more satisfactory. The percent of error in the first method was obviously large when attempts were made to estimate the population per square foot when on some trees it was possible to examine only 1/7 or even less of the band on a tree because of the heavy infestation. Believing that no satisfactory system of approximating a distinct population figure in the field is feasible, the system of basing the counts on a time basis, where an equal amount of time is spent in all infestations, appears to me as being more suitable. The following is an example of some observations taken at a salicis infestation under such a system.

Town _____

Location _____

Time allowed: 1 man hour on 5 poplar trees

1.	Webs examined	112
	Larva dead - cause unknown	10
2.	Live larvae - no parasites	24
3.	Larvae containing 1st instar *A. solitarius*	54
4.	Larvae containing late instar *A. solitarius*	1
5.	Larvae containing Meteorus larva	1
6.	Webs containing *A. solitarius* cocoons formed this fall	18
7.	Larvae killed by Eupteromalus	4

"This allowed 20 minutes for examining webs on each tree. If no webs were found on any one tree the time was allotted to the other trees. A random sample was the intention and I believe this examination gives that.

"Items 2, 3, 4, 5 are determined by dissection of the live larvae. Items 1 and 7 are the only counts necessary in the field unless some unlisted factor such as Pediculoides is encountered.

"The following season spending a similar period of time the record should be a basis for comparison in all of these items. Item 1 should indicate a rise or fall in the infestation which is about all one can expect to determine on population.

"Additional suggestions:

"If detailed studies of infestations were to be made I would suggest the following:

1. Make examinations of hibernating larvae twice - 1 - in the fall after all are in hibernation; 2 - in the spring before larvae leave hibernation to study mortaility between the two periods.

2. Make collections of 100 larvae about a week after larvae leave hibernation.

3. Make collections of 100 large larvae before pupation starts.

4. Make collections of 100 pupae (in areas where pupal parasitism has not been tested).

5. Make collections of eggs (in areas where egg parasitism has not been tested).

"In addition I believe that frequent field observations are absolutely important if the data are to be useful in the study of the host insect. "

D. E. Parker
Nov. 2, 1934

In connection with parasite determination from dissection, etc.

Parasite larvae likely to be found in hibernating S. salicis.

Apanteles solitarius (Ratz.) (see Technical bulletin No. 477 U. S. D. A., 1935)

Larva with transparent body, head concolorus, squarish; caudal end furnished with bladder like anal vesicle. Length .58 mm. Since the anal vesicle persists in the instars this character will serve to separate the species from all

Meteorus versicolor Wesm. (see Journal Agriculture Research, vol. 14 No. 5, 1918) which may be described as follows:

Larva with large, brown, heavily chitinized head capsul and long caudal horn. Length 1.5 mm. The later instars do not possess the above characters but the yellow, cylindrical larva without caudal vesicle is sufficient for its identification.

Rogas unicolor Wesm.
Immature stages unknown - the pupa formed within the larval skin of the host.

The pupae and adults of Apanteles and Meteorus are readily recognized from the illustrations given in the publications cited.

Eupteromalus nidulans (Thomson)

This species is an external parasite and spends the winter as a full grown larva within the hibernaculum of S. salicis.

While its color is entirely white it appears slatish due to contents of alimentary tract that show through body wall. For further particulars see Journal Agriculture Research, Vol. 43, No. 1, 1931.

Tachinid Parasites from the Last Larval Instars of the Satin Moth

The difficulty in specifically determining the native tachinids was one of the reasons for rearing the satin moth larvae. Dissection of the large larvae is laborious and unless one uses the most extreme care the young parasite larvae are often overlooked. Also very frequently the parasite larvae is in a transition stage and most difficult to identify. For the above reasons I believe that these dissections are less reliable than the rearings. However, if dissections of the larvae are to be made, Compsilura may be readily recognized in the first two instars by the presence of anal hooks adjacent to the posterior spiracles, and the third instar by the form of the mouth hooks and location and shape of the posterior spiracles (see U.S.D.A. Bull. No. 766, 1919).

None of the other species (Exorista mella, Tachinomyia similis and Tachinid sp. have these characters but I am unable to characterize them satisfactorily at the present time.

No adults emerged from the tachinid sp. and it remains unknown. Compsilura may be separated from Tachinomyia similis and Exorista mella by the hairy eyes and absence of ocellar bristles. The two later species are readily distinguished from one another as follows:

Fourth vein with wrinkle; outer forceps of male fused. (Single generation; hibernates as a pupa) ---------- Tachinomyia

Fourth veins without wrinkle; outer forceps separated. (Two generations; hibernates as a larva) ---------- Exorista mella

The material that you sent for determination is being returned under separate cover. Your identifications were all correct except in the case of the fly from Monmouth, Oregon, which is a Sarcophagid. I could not locate any of the material mention in your note from Gervais, Oregon (18,879-C) and wonder if it was included with that sent me.

I am also sending you the photographic prints of the observation point described in my memorandum of August, 1935, and specimens of Tachinomyia similis.

Ray T. Weldon